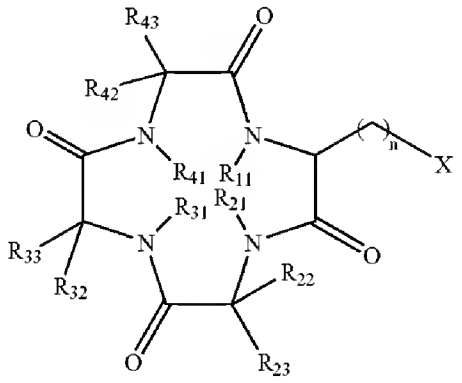
Amendments to the Claims

This listing of claims replaces all prior versions and listings of claims in the application.

Listing of Claims

1. (Original) A compound represented by formula (1)

(1)



wherein

R_{11}, R_{21}, R_{31}, and R_{41} independently represent a hydrogen or methyl group;

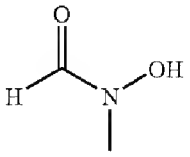
R_{22}, R_{23}, R_{32}, R_{33}, R_{42}, and R_{43} independently represent any one of hydrogen, a linear alkyl group comprising 1 to 6 carbons, a linear alkyl group comprising 1 to 6 carbons to which a non-aromatic cyclic alkyl group or a substituted or unsubstituted aromatic ring is attached, a non-aromatic cyclic alkyl group, or a non-aromatic cyclic alkyl group to which a non-aromatic cyclic alkyl group or a substituted or unsubstituted aromatic ring is attached;

R_{21} and R_{22}, R_{22} and R_{23}, R_{31} and R_{32}, R_{32} and R_{33}, R_{41} and R_{42}, and R_{42} and R_{43} may independently represent a non-cyclic structure without bonding to each other, or may independently represent a cyclic structure by bonding to each other through a linear alkylene group having a chain length of 1 to 5 carbons, a linear alkylene chain having a chain length of 1 to 5 carbons and carrying a branched chain of 1 to 6 carbon atoms, or a linear alkylene chain having a chain length of 1 to 5 carbons and carrying a cyclic structure of 1 to 6 carbon atoms;

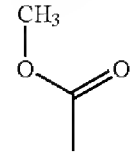
n can be selected from a range of numbers that enable the compound to have HDAC inhibitory activity; and

X represents a structural component having a structure that can coordinate with the zinc positioned at the active center of histone deacetylase.

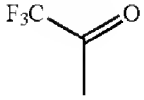
2. (Original) The compound of claim 1, wherein X is any one of the substituents represented by the following structural formulas:



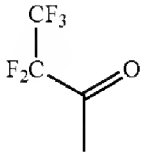
N(OH)COH



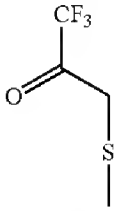
COOMe



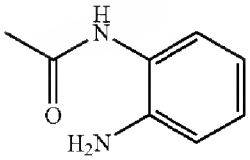
Tfk



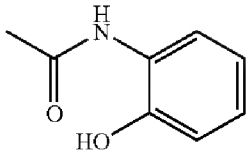
Pfek



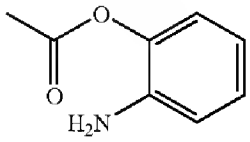
Mtfk



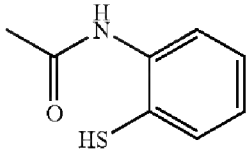
OPD



OAPOH



OAPNH



OATP

3. (Original) A histone deacetylase inhibitor comprising the compound of claim 1 as an active ingredient.

4. (Original) A tubulin deacetylase inhibitor comprising the compound of claim 1 as an active ingredient.

5. (Original) An apoptosis inducer comprising the compound of claim 1 as an active ingredient.

6. (Original) A differentiation inducer comprising the compound of claim 1 as an active ingredient.

7. (Original) An angiogenesis inhibitor comprising the compound of claim 1 as an active ingredient.

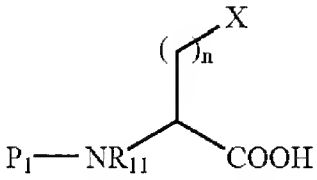
8. (Original) A cancer metastasis inhibitor comprising the compound of claim 1 as an active ingredient.

9. (Currently Amended) A pharmaceutical agent ~~for treatment or prevention of a disease caused by histone deacetylase, wherein the agent~~ which comprises the compound of claim 1 as an active ingredient.

10. (Cancelled)

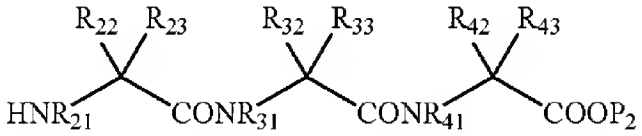
11. (Withdrawn) A method for producing the compound of claim 1, wherein the method comprises reacting a compound represented by formula (2)

(2)



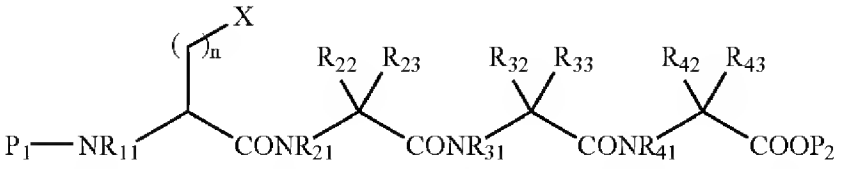
(wherein n, R_{11}, and X are as defined in claims 1 and 2, and P_1 represents an amino protecting group) with a compound represented by formula (3)

(3)



(wherein R_{11}, R_{21}, R_{22}, R_{23}, R_{31}, R_{32}, R_{33}, R_{41}, R_{42}, and R_{43} are as defined in formula (1) of claim 1, and P_2 represents a carboxyl protecting group) in the presence of a peptide coupling agent to yield a compound represented by formula (4)

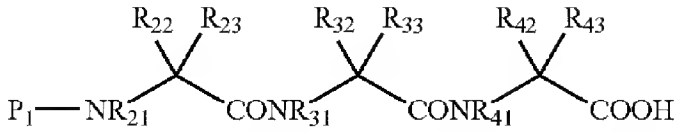
(4)



(wherein n, R_{11}, R_{21}, R_{22}, R_{23}, R_{31}, R_{32}, R_{33}, R_{41}, R_{42}, R_{43}, P_1, P_2, and X are defined above), then subjecting the compound represented by formula (4) to catalytic hydrogenation, acid treatment, or hydrolysis to remove P_1 and P_2, and subsequently, carrying out a cyclization reaction in the presence of a peptide coupling agent;

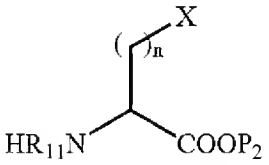
reacting a compound represented by formula (5)

(5)



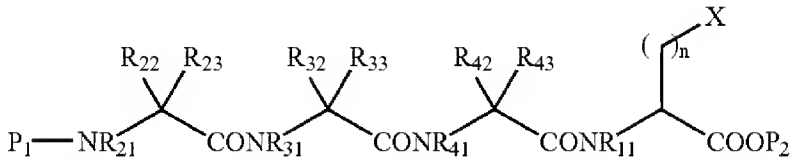
(wherein R_{21}, R_{22}, R_{23}, R_{31}, R_{32}, R_{33}, R_{41}, R_{42}, R_{43}, and P_1 are as defined above) with a compound represented by formula (6)

(6)



(wherein n, R_{11}, P_2, and X are as defined above) in the presence of a peptide coupling agent to yield a compound represented by formula (7)

(7)



(wherein n, R_{11}, R_{21}, R_{22}, R_{23}, R_{31}, R_{32}, R_{33}, R_{41}, R_{42}, R_{43}, P_1, P_2, and X are as defined above), then subjecting the compound represented by formula (7) to catalytic hydrogenation, acid treatment, fluoride anion treatment, or hydrolysis to remove P_1 and P_2, and subsequently, carrying out a cyclization reaction in the presence of a peptide coupling agent; or

reacting a compound in which X of the cyclic tetrapeptide of formula (1) is a carboxyl group or a sulfhydryl group individually with trifluoroacetic anhydride, pentafluoropropanoic anhydride, or 1,1,1-trifluoro-3-bromoacetone to change substituent X into a different type of substituent.